

What is claimed is:

1. 1. A method for providing quality of service (QoS)-driven channel access within a basic service set (BSS) in a wireless network, the method comprising steps of:
  3. determining at a point coordinator (PC) station of the BSS whether at least one of up-stream traffic and side-stream traffic is scheduled to be transmitted from at least one non-PC station in the BSS;
  6. determining at the PC station whether at least one transmission opportunity (TO) is available during a contention free period (CFP) of a superframe for transmitting one of up-stream traffic and side-stream traffic in the BSS, the superframe containing the CFP and a contention period (CP);
  10. allocating at least one available TO to a selected non-PC having at least one of up-stream traffic and side-stream traffic to transmit; and
  12. sending a multipoll frame from the PC station containing information relating to each allocated TO, the multipoll frame identifying each respective allocated TO by a duration time and one of a virtual stream identifier (VSID) and an association identifier (AID).
2. 2. The method according to claim 1, wherein the duration time for a TO is a maximum length of time for the TO.

1           3.     The method according to claim 1, wherein a first TO begins a short interframe  
2     spacing (SIFS) period of time after an end of the multipoll frame.

1           4.     The method according to claim 1, wherein the multipoll frame contains  
2     information relating to at least two allocated TOs, each successive TO starting after a  
3     preceding TO when a duration time associated with the preceding TO expires.

1           5.     The method according to claim 1, wherein the multipoll frame contains  
2     information relating to at least two allocated TOs,

3                 wherein when a data frame that is indicated to be a final data frame is  
4     transmitted in a selected TO, a TO that is subsequent to the selected TO begins a short  
5     interframe spacing (SIFS) period of time after the preceding station sends the final data  
6     frame.

1           6.     The method according to claim 5, wherein the TO that is subsequent to the  
2     selected TO ends when a duration time associated with the TO that is subsequent to the  
3     selected TO ends.

1           7.     The method according to claim 6, wherein when the TO that is subsequent to  
2     the selected TO is a last TO identified in the multipoll frame, any remaining time is returned

3 for reallocation by the PC station.

1           8.     The method according to claim 1, wherein the multipoll frame includes  
2 information relating to at least one VSID and the duration time;

3                 the method further comprising steps of:

4                 receiving the multipoll frame at a non-PC station for which an available TO  
5 was allocated; and

6                 transmitting from the non-PC station at least one data frame during the TO  
7 allocated to the non-PC station, the at least one data frame being associated with the VSID.

1           9.     The method according to claim 8, wherein the at least one data frame is part  
2 of an up-stream traffic.

1           10.    The method according to claim 8, wherein the at least one data frame is part  
2 of a side-stream traffic.

1           11.    The method according to claim 8, wherein the at least one data frame  
2 transmitted by the non-PC station originates from one of a continuous/periodic flow type of  
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-  
4 effort/asynchronous traffic source.

1           12. The method according to claim 1, wherein the multipoll frame includes  
2 information relating to at least one VSID and the duration time;

3                 the method further comprising steps of:

4                 receiving the multipoll frame at a non-PC station for which an available TO  
5 was allocated; and

6                 transmitting from the non-PC station at least one data frame during the TO  
7 allocated to the non-PC station, the at least one data frame being associated with a selected  
8 VSID that is different from the VSID identified in the multipoll frame, and the at least one  
9 data frame being transmitted based on a comparison of a QoS parameter set associated with  
10 the selected VSID and a QoS parameter set associated with the VSID identified in the  
11 multipoll frame.

1           13. The method according to claim 1, wherein the multipoll frame includes  
2 information relating to at least one AID and the duration time;

3                 the method further comprising steps of:

4                 receiving the multipoll frame at a non-PC station for which an available TO  
5 was allocated; and

6                 transmitting from the non-PC station at least one data frame during the TO  
7 allocated to the non-PC station, the at least one data frame being transmitted based

8 completely on a determination made by a frame scheduling entity (FSE) of the non-PC  
9 station.

1 14. The method according to claim 1, wherein the wireless network is a wireless  
2 local area network (WLAN).

1 15. A point coordinator (PC) station in a basic service set (BSS) in a wireless  
2 network, the PC station comprising:

3 a frame scheduling entity (FSE) determining whether at least one of up-stream  
4 traffic and side-stream traffic is scheduled to be transmitted from at least one non-PC station  
5 in the BSS, the FSE determining whether at least one transmission opportunity (TO) is  
6 available during a contention free period (CFP) of a superframe for transmitting one of up-  
7 stream traffic and side-stream traffic in the BSS, the superframe containing the CFP and a  
8 contention period (CP), the FSE allocating at least one available TO to a selected non-PC  
9 having at least one of up-stream traffic and side-stream traffic to transmit; and

10 a transmitter sending a multipoll frame from the PC station containing  
11 information relating to each TO allocated by the FSE, the multipoll frame identifying each  
12 respective allocated TO by a duration time and one of a virtual stream identifier (VSID) and  
13 an association identifier (AID).

1           16.     The PC station according to claim 15, wherein the duration time for a TO is a  
2     maximum length of time for the TO.

1           17.     The PC station according to claim 15, wherein a first TO begins a short  
2     interframe spacing (SIFS) period of time after an end of the multipoll frame.

1           18.     The PC station according to claim 15, wherein the multipoll frame contains  
2     information relating to at least two allocated TOs, each successive TO starting after a  
3     preceding TO when a duration time associated with the preceding TO expires.

1           19.     The PC station according to claim 15, wherein the multipoll frame contains  
2     information relating to at least two allocated TOs,  
3                 wherein when a data frame that is indicated to be a final data frame is  
4     transmitted in a selected TO, a TO that is subsequent tot the selected TO begins a short  
5     interframe spacing (SIFS) period of time after the preceding station sends the final data  
6     frame.

1           20.     The PC station according to claim 19, wherein the TO that is subsequent to  
2     the selected TO ends when a duration time associated with the TO that is subsequent to the  
3     selected TO ends.

1           21. The PC station according to claim 15, wherein the multipoll frame includes  
2 information relating to at least one VSID and the duration time;

3                         the PC station further comprising a non-PC station in the BSS receiving the  
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was  
5 allocated, the non-PC station transmitting at least one data frame during the TO allocated to  
6 the non-PC station.

1           22. The PC station according to claim 21, wherein the at least one data frame is  
2 part of an up-stream traffic.

1           23. The PC station according to claim 21, wherein the at least one data frame is  
2 part of a side-stream traffic.

1           24. The PC station according to claim 21, wherein the at least one data frame  
2 transmitted by the non-PC station originates from one of a continuous/periodic flow type of  
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-  
4 effort/asynchronous traffic source.

1           25. The PC station according to claim 15, wherein the multipoll frame includes  
2 information relating to at least one VSID and the duration time;

3                         the PC station further comprising a non-PC station in the BSS receiving the  
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was  
5 allocated, the PC station transmitting at least one data frame during the TO allocated to the  
6 non-PC station, the at least one data frame being associated with a selected VSID that is  
7 different from the VSID identified in the multipoll frame, and the at least one data frame  
8 being transmitted based on a comparison of a QoS parameter set associated with the selected  
9 VSID and a QoS parameter set associated with the VSID identified in the multipoll frame.

1           26. The PC station according to claim 15, wherein the multipoll frame includes  
2 information relating to at least one AID and the duration time;

3                         the PC station further comprising a non-PC station in the BSS receiving the  
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was  
5 allocated, and the non-PC station transmitting from the non-PC station at least one data  
6 frame during the TO allocated to the non-PC station, the at least one data frame being  
7 transmitted based completely on a determination made by the FSE of the non-PC station..

1           27. The PC station according to claim 15, wherein the wireless network is a  
2 wireless local area network (WLAN).